

Article

The Role of Subjective Socioeconomic Status in Predicting Academic Performance: Exploring the Mediating Influence of Sense of Belonging among Students in a Distance Learning University

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Abstract

Building upon existing research conducted in face-to-face universities, our research explored whether, in the context of a distance learning institution, the positive association between subjective socioeconomic status and academic performance can be explained by students' sense of belonging. To that end, we conducted a three-wave correlational study with 2,261 students enrolled in Social Psychology in a distance learning university. At the start of the academic year, we measured participants' subjective socioeconomic status relative to other students alongside their initial expectations in terms of time investment and grades and other relevant covariates. Midway through the course, we assessed their sense of belonging to the university and, at the end, we recorded their grades. Results suggested that sense of belonging potentially serves as a mediating factor in the positive relationship between subjective socioeconomic status and grades even after accounting for variables like initial grade expectations, time commitment, gender, age, and employment situation. These findings emphasize the pivotal role of students' psychological connection to the university in shaping their academic achievement, even within the expanding landscape of distance education.

Keywords: academic performance; distance learning; higher education; sense of belonging; socioeconomic status

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Academic achievement in higher education is influenced by a myriad of personal and social factors beyond intelligence and effort. Among these factors, socioeconomic status and sense of belonging have garnered considerable attention due to their profound impact on academic outcomes. Students with low (vs. high) socioeconomic status seem to present a weaker sense of belonging to the university which, in turn, undermines their academic engagement and success in college. This paper aims to explore the interplay between socioeconomic status, sense of belonging, and academic achievement among students at a distance learning university, a scenario that has hardly been explored in previous research on this topic, but that will probably have a greater influence on the future of education. Whereas certain attributes (e.g., limited interactions) of distance learning universities can have an adverse impact on the feeling of belonging, others can promote it (e.g., greater diversity). Therefore, we propose that sense of belonging may play a crucial role on the association between socioeconomic status and academic performance also in distance learning settings.

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Socioeconomic Status, Sense of Belonging and Academic Achievement

Sense of belonging refers to the extent to which individuals feel accepted, valued, and integrated into their own community. Studies have consistently indicated that a robust sense of belonging within an academic community is closely linked to higher levels of engagement, self-efficacy, motivation, well-being, and achievement (Freeman et al., 2007; Ostrove & Long, 2007; Walton & Cohen, 2007, 2011; Walton et al., 2023; Yeager et al., 2016; Zumbunn et al., 2014). Thus, those students who possess a heightened sense of belonging are better positioned to thrive academically. The available evidence indicates that the sense of university belonging is not solely shaped by individual factors; rather, it is significantly impacted by one's group affiliation. For instance, in North American universities, black students often experience greater levels of uncertainty regarding their belonging to university compared to white students, and this uncertainty subsequently exerts negative repercussions on their physical well-being, mental health, and academic achievements (Walton & Cohen, 2011).

Previous research also reveals that students from lower socioeconomic backgrounds tend to experience a weaker sense of college belonging compared to their higher socioeconomic counterparts (Jury et al., 2019; Ostrove & Long, 2007; Reay et al., 2010; Soria & Stebleton, 2013). Different factors explain the relationship between students' socioeconomic status and their connection to their university. On the one hand, students from lower socioeconomic backgrounds often face more financial concerns and have more

familial responsibilities than students from high socioeconomic levels, which limits their participation in social activities and hinders their social integration (Rubin & Wright, 2017). On the other hand, different psychological mechanisms partly explain the association between low socioeconomic status and a weaker sense of belonging. Environmental cues such as the awareness of the numerical underrepresentation of students of lower socioeconomic status or acknowledging negative class stereotypes can lead individuals from lower economic backgrounds to entertain the notion that people like them do not fit in evoking sentiments of uncertainty regarding belonging (Froehlich et al., 2023; Walton & Cohen, 2007, 2011). These belonging concerns might, in turn, lead students of low socioeconomic status to make extremely negative interpretations of the typical difficulties (e.g., academic obstacles) that affect everyone, starting a vicious circle that harms their well-being and academic performance (Walton & Cohen, 2011). In fact, Ostrove and Long (2007) found evidence suggesting that the effect of socioeconomic status on academic performance is not direct, but indirect through feelings of belonging.

Ostrove and Long's (2007) results indicated that sense of belonging seems to mediate the effect of both objective (e.g., family income, parents' education) and subjective measures (e.g., perception of one's position within the socioeconomic hierarchy) of socioeconomic status on academic results. However, the relationships were stronger when subjective estimates were used, in line with additional evidence demonstrating that subjective measures of socioeconomic status might be better predictors of psychological functioning and health than objective measures (e.g., Adler et al., 2000). The superiority of subjective measures over objective measures of socioeconomic status may stem from their ability to offer a more comprehensive evaluation. While objective measures provide a snapshot of present resources, subjective indicators offer a more holistic assessment that accounts for historical and current outcomes, alongside future prospects in light of individuals' social and cultural environment (Zhao et al., 2023). Hence, in the current research, we will focus on subjective socioeconomic status.

The Current Research

In a three-wave correlational study, we examined the potential mediating role of sense of belonging in the relationship between subjective socioeconomic status and academic achievement in college students. At the beginning of the academic year (November), we measured different covariates (sociodemographic data, initial expectations) along with two types of subjective socioeconomic status: general—in relation to the whole society—and specific—in relation to other students from the same university—. Since comparisons with others in the close context often surpass the significance of absolute indicators of status (Loeb & Hurd, 2019), we expected that socioeconomic status in relation to other students would have a stronger effect on perceived belonging to the university than general socioeconomic status. We assessed students' sense of belonging to the university in the middle of the academic year (February). Finally, upon the course's conclusion (June), we collected an objective indicator of academic performance. In particular, we recorded the grades for the two exams that determine the course's pass or fail outcome.

Unlike previous research, we analyzed the connections between subjective socioeconomic status, sense of belonging, and academic achievement in the context of distance education. Distance learning offers flexibility and accessibility, but it also presents unique characteristics such as geographic dispersion and online social interactions that can potentially hinder the development of a sense of

belonging as compared to face-to-face encounters (Hall et al., 2023). Conversely, universities that offer distance learning programs boast a student body characterized by greater diversity compared to traditional face-to-face institutions. This diversity opens avenues for various forms of intergroup interactions, including cross-class social encounters, which have been shown to enhance feelings of belonging and bolster academic performance among students from less privileged backgrounds (Carey et al., 2022). Besides, it is also possible that in distance learning environments based on written communication (e.g., chats, blogs, videoconferences, and virtual meetings) some class markers, such as clothing, accessories, makeup, hairstyle, or speech cues, are less prominent, which would blur the impact of socioeconomic status on social evaluation. In other words, although some characteristics of distance learning universities can negatively affect the sense of belonging, others can cushion that impact. Therefore, we expected to find an indirect effect of perceived socioeconomic status on academic performance through sense of belonging to a distance university consistent with the findings obtained in face-to-face institutions (Ostrove & Long, 2007).

Method

Participants

Two thousand, two hundred and sixty-one Psychology students participated in an online study for course credits¹. The students at this university are dispersed across various regions in Spain in both urban and rural areas, with smaller groups situated in other European countries and in South and North America. The sample consisted of 80.6% women ($n = 1,823$) and 19.4% men ($n = 438$) with a mean age of 30.93 years ($SD = 11.65$) and an age range between 17 and 76. Among them, 93.9% (2,122) had Spanish nationality, 50.8% ($n = 1,148$) had a college degree, 60.7% (1,373) were first-generation students, 60.2% ($n = 1,361$) had a paid job, 23.4% ($n = 529$) had at least one child, 14.2% ($n = 321$) had taken (and previously failed) the course and 33.0% ($n = 745$) had previously taken other subjects at this same university.

We conducted a Monte Carlo power analysis for indirect effects using the app developed by Schoemann and colleagues (2017). This analysis indicated that, considering 5,000 replications, 20,000 Monte Carlo draws per replication and 95% confidence interval, a sample size of 2,261 participants provided 100% power to assess the indirect effect.

Procedure

At the beginning of the academic year (November 2022), 9,427 students enrolled in a first-year subject (Social Psychology) at a distance-learning university received information about the possibility of participating voluntarily in an online study designed to analyze the psychosocial factors that influence academic performance. Participation in this study would add 0.5 points to the final course grade. Those who decided to participate completed in November a series of sociodemographic data such as sex, age, nationality, number of children, job occupation, and their perceived socioeconomic status in relation to society, in general, and in

¹One hundred and nineteen additional students completed the questionnaires but did not take the exams. There were no differences in general or specific socioeconomic status between participants who did and did not take the exams, $p_s > .084$, $\eta^2_{ps} = .001$.

relation to other students of the same institution. These last two variables were assessed through the MacArthur scale, which consists of a ladder that represents the socioeconomic hierarchy. Participants read that “At the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off, those who have the least money, least education, worst jobs, or no job.” Participants were asked to select the rung that best represented where they think they stand on the ladder in relation to (1) the Spanish society and (2) other students at their university. Participants also reported whether they themselves had a college degree as well as the education completed by their parents to verify whether they were first-generation students. Finally, they indicated their initial expectations regarding (1) the number of hours per week that they would dedicate to the study of the subject and (2) their final grade (from 0 to 10).

In the middle of the academic year (February), participants completed a scale of sense of belonging to the university consisting of four Likert-type items adapted from Yeager et al. (2016) and ranging from 0 (*Strongly disagree*) to 6 (*Strongly agree*), Cronbach alpha = .86. The items were: “I feel confident that I belong at [university name],” “I wonder if I really fit in [university name]” (reverse-coded), “Sometimes I worry that I do not belong at [university name]” (reverse-coded) and “I am certain that I fit in at [university name]” (higher scores mean stronger belonging). All items loaded on the same factor presenting high factor loadings (> .66). Finally, at the end of the academic year (June) we registered and averaged (10 as the maximum) the marks of two exams (February and June exams) that determine the grade in the subject.

Data and materials are available at: https://osf.io/5q43s/?view_only=56269458702a4ed68e870c1a09a90708. The research was approved by the university and funded by a grant from its Vice-Rectorate of Digitalization and Innovation.

Results

Preliminary Analyses

We first compared the grades of our participants with those of the other students who took the exams but did not participate in the study ($n = 3,985$). Our participants ($M = 5.03$, $SD = 1.89$) obtained higher grades than non-participants ($M = 4.04$, $SD = 1.87$), $F(1, 6244) = 400.50$, $p < .001$, $\eta^2_p = .06$.

Then, we calculated the bivariate correlations between the continuous variables as Table 1 shows. The two measures of subjective socioeconomic status (general and related to other students) were positively but modestly correlated. Interestingly, subjective socioeconomic status in relation to other students correlated positively with the expected grade and sense of belonging. Sense of belonging correlated positively with age and real grades.

To test the hypothesis that higher subjective socioeconomic status in relation to other students will be associated with a stronger sense of belonging while controlling for other influential factors, we conducted a first regression analysis. As Table 2 shows most covariates had significant effects. The sense of belonging to the university was stronger among those who expected a higher grade, men (vs. women), older students, people who had children (vs. those who had no children), people who had a job (vs. those who did not work), those who were enrolling for the first time in the subject (vs. repeaters), and first-generation students (vs. those whose parents had a college degree). All these effects were modest, $\beta < .10$, except the effect of age. Importantly, consistent with our hypothesis, higher subjective socioeconomic status in relation to other students was associated with a stronger sense of belonging. However, the effect of general socioeconomic status was not significant.

We then conducted a second regression analysis considering the grades as the outcome variable and including sense of belonging among the predictors. This regression analysis also yielded significant effects of some of the covariates. The grades were higher among those who expected to dedicate less time, those who expected a higher grade, men (vs. women), older students, Spaniards (vs. non-Spaniards), people without children (vs. those who had them), freshman students (vs. those who had previous experience at the university), those who were enrolling for the first time in the subject (vs. repeaters), those who had a college degree (vs. those who had not) and first-generation students (vs. those whose parents had a college degree). Importantly, neither general socioeconomic status nor socioeconomic status in relation to other students were associated with the grades. However, the effect of belonging was significant, indicating that the stronger sense of belonging, the better grades. This pattern of results would be consistent with the hypothesis that sense of belonging might mediate the effect of subjective socioeconomic status in relation to other students on the grades.

Table 1. Descriptive Statistics and Correlations

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7
1. Time dedication	8.98	8.03	.12***	-.01	.04	-.10***	-.03	-.08***
2. Expected grade	7.36	1.20	–	.05*	.26***	-.14***	.11***	.08***
3. SES (general)	5.70	1.39	–	–	.28***	.12***	.14**	.08***
4. SES (university)	5.77	1.56	–	–	–	.03	.21***	.07**
5. Age	30.93	11.65	–	–	–	–	.29***	.11***
6. Belonging	3.83	1.29	–	–	–	–	–	.19***
7. Real grade	5.03	1.89	–	–	–	–	–	–

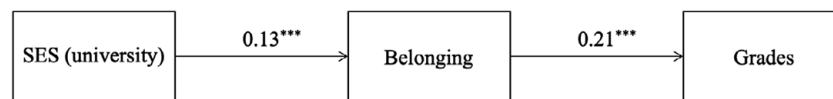
Notes. SES = Subjective socioeconomic status.

*** $p < .001$; ** $p < .01$; * $p < .05$.

Table 2. Regression Analyses

Predictor	Sense of Belonging					Grades				
	<i>b</i>	95% CI		<i>p</i>	β	<i>b</i>	95% CI		<i>p</i>	β
		<i>LL</i>	<i>UL</i>				<i>LL</i>	<i>UL</i>		
Time dedication	0.00	-0.01	0.00	.353	-.02	-0.02	-0.03	-0.01	.002	-.07
Expected grade	0.11	0.07	0.15	<.001	.10	0.13	0.07	0.20	<.001	.09
Sex	0.29	0.16	0.42	<.001	.09	0.33	0.13	0.52	.001	.07
Age	0.03	0.02	0.03	<.001	.23	0.02	0.01	0.03	<.001	.11
Nationality	-0.11	-0.32	0.10	.292	-.02	-0.65	-0.98	-0.33	<.001	-.08
Children	0.18	0.01	0.34	.033	.06	-0.45	-0.70	-0.21	<.001	-.11
Work	-0.16	-0.27	-0.05	.005	-.06	0.02	-0.13	0.19	.848	.00
Experience	0.10	-0.03	0.23	.141	.04	0.25	0.05	0.45	.012	.06
Repeater	-0.25	-0.41	-0.08	.004	-.07	-0.31	-0.56	-0.05	.020	-.06
Graduate	-0.05	-0.15	0.06	.373	-.02	0.27	0.11	0.44	.001	.07
First-generation	-0.12	-0.23	-0.02	.021	-.05	-0.22	-0.38	-0.06	.008	-.06
SES (general)	0.03	0.00	0.07	.077	.04	0.03	-0.03	0.09	.308	.02
SES (university)	0.13	0.01	0.17	<.001	.16	0.00	-0.05	0.05	.992	.00
Belonging						0.21	0.15	0.28	<.001	.14

Note. SES = Subjective socioeconomic status. Coding: Sex (0 = Woman, 1 = Man), Nationality (0 = Spanish, 1 = Other), Children (0 = No, 1 = Yes), Work (0 = Yes, 1 = No), Experience (0 = No, 1 = Yes), Repeater (0 = No, 1 = Yes), Graduate (0 = No, 1 = Yes), First-generation (0 = No, 1 = Yes). The significant effects of our variables of interest (subjective socioeconomic status and sense of belonging) are emphasized in bold.

**Figure 1.** Higher Subjective Socioeconomic Status in Relation to Other Students Seems to Improve Grades by Reinforcing the Sense of Belonging.

Note. SES = Subjective socioeconomic status.

*** $p < .001$.

Mediation Analysis

To test this hypothesis, we conducted a mediation analysis using PROCESS (Hayes, 2017, Model 4) including subjective socioeconomic status in relation to other students as the predictor, sense of belonging as the mediator, and grades as the outcome plus all the covariates. As depicted in Figure 1, the indirect effect of subjective socioeconomic status in relation to other students on grades via sense of belonging was significant, $b = 0.03$, 95% CI [0.02, 0.04], whereas the direct, $b < -0.001$, 95% CI [-0.05, 0.05], and the total effects, $b = 0.03$, 95% CI [-0.02, 0.08], were not.

Discussion

The present study examined the connections among subjective socioeconomic status, sense of belonging, and academic achievement in the realm of higher education, with a specific focus on the context of distance learning. Consistent with existing research, we found that subjective socioeconomic status was positively associated with students' sense of belonging to the university in the middle of the first academic year, and their sense of belonging predicted their academic performance even when controlling for their initial expectations regarding their grades and time investment and other covariates (e.g., sex, age, general subjective socioeconomic status, etc.).

Our findings align with prior research conducted in face-to-face university settings, revealing a positive link between students' socioeconomic status and their sense of belonging within the university (Jury et al., 2019; Ostrove & Long, 2007; Reay et al., 2010; Soria & Stebleton, 2013). Besides, our study also reinforces the pivotal role that a strong sense of belonging plays in students' academic achievement (Freeman et al., 2007; Walton & Cohen, 2007, 2011; Yeager et al., 2016). Sense of belonging seems to operate as a mediating mechanism through which subjective socioeconomic status exerts its influence on academic achievement. This mediation effect highlights the intricate interplay between psychological perceptions and academic outcomes, emphasizing the significance of socio-emotional factors in shaping students' trajectories. These findings contribute to the evolving body of literature concerning the factors that influence students' academic outcomes, shedding light on the nuanced relationships that exist within the realm of remote learning environments.

The unique landscape of distance education adds a layer of complexity to these relationships. Asynchronous learning, geographic dispersion, online interactions, and greater diversity introduce novel challenges and opportunities for students' sense of belonging. Our participants exhibited a moderate level of university belonging, akin to findings from other studies conducted in traditional face-to-face universities (e.g., Talaifar et al., 2021). Subsequent research endeavors will need to identify the shared and unique

factors that impact the sense of belonging in both physical and online educational institutions.

Our findings hold significant implications for policymakers and educational institutions seeking to promote academic success. Naturally, the most direct approach towards ensuring equitable access to higher education for all citizens involves addressing overarching inequality and adequately financing public education. Simultaneously, policymakers must acknowledge that students hailing from lower socioeconomic backgrounds could encounter unique obstacles stemming from financial limitations, familial obligations, and restricted resource accessibility. These challenges can impede their initial entry and ongoing participation in university life, in both face-to-face and distance learning contexts, ultimately eroding their sense of belonging. In this context, offering accessible and comprehensive financial support packages (including scholarships, subsidized learning materials, and technological resources) holds the potential to alleviate the burdens confronted by students from less privileged backgrounds. Such provisions would allow these students to focus more on their academic pursuits. Furthermore, the increased presence of students with lower socioeconomic status can effectively counteract the perception that individuals like them lack a rightful place within the university environment. To contribute to this effort, both face-to-face and distance learning universities could include images of real students with occupations associated with the working class (e.g., telemarketing, food distribution) into institutional advertising campaigns. This shift could have a positive impact on the mental well-being and academic performance of students from underrepresented groups, as highlighted by previous research (Walton & Cohen, 2011; Walton et al., 2023; Zumbunn et al., 2014).

While this study provides valuable insights, certain limitations must be acknowledged. The correlational design limits causal inferences. Although a reciprocal relationship between the sense of belonging and grades is plausible, our study did not identify grades as a mediating factor. Nonetheless, in forthcoming research, an avenue worth exploring could involve attempting to manipulate the sense of belonging to examine potential alterations in the relationship between socioeconomic status and academic performance. Additionally, despite efforts to incentivize student involvement in the research through a bonus in the final grade, aimed at ensuring sample representativeness, it appears that a self-selection bias occurred. Participants who engaged in the study achieved higher scores compared to those who abstained. We cannot rule out that these participants could also exhibit disparities in other factors, such as their sense of belonging, socioeconomic status, motivation, or the time allocated to supplementary study-related activities. Lastly, given that our participants were in the initial stages of their studies, the potential fluctuations in the impact of socioeconomic status on the sense of belonging and academic achievement among students at more advanced stages remain unexplored. Subsequent investigations could encompass participants from diverse courses to comprehensively assess the constancy or evolution of these associations across the course of their university experience.

In conclusion, our study illuminates the intricate interplay between subjective socioeconomic status, sense of belonging, and academic achievement within the realm of a distance learning university. As universities increasingly embrace remote learning models, understanding these complex relationships becomes paramount in ensuring equitable and supportive educational environments. Our results suggested that the detrimental effect of low socioeconomic status on academic achievement may be mediated by a reduced sense of belonging to the university. Although tackling structural problems such as socioeconomic inequality or disparity

in access to higher education demands deep and systemic approaches, universities must take concrete steps to ensure that students from disadvantaged backgrounds experience a sense of inclusion within the institution.

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Competing interest. None.

Data sharing. Data and materials are available at: https://osf.io/5q43s/?view_only=fbd88737c944444cbba66d756a3574b4.

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